

2013

Engineering Department Business Plan



City of Sugar Land

2013

ENGINEERING DEPARTMENT BUSINESS PLAN

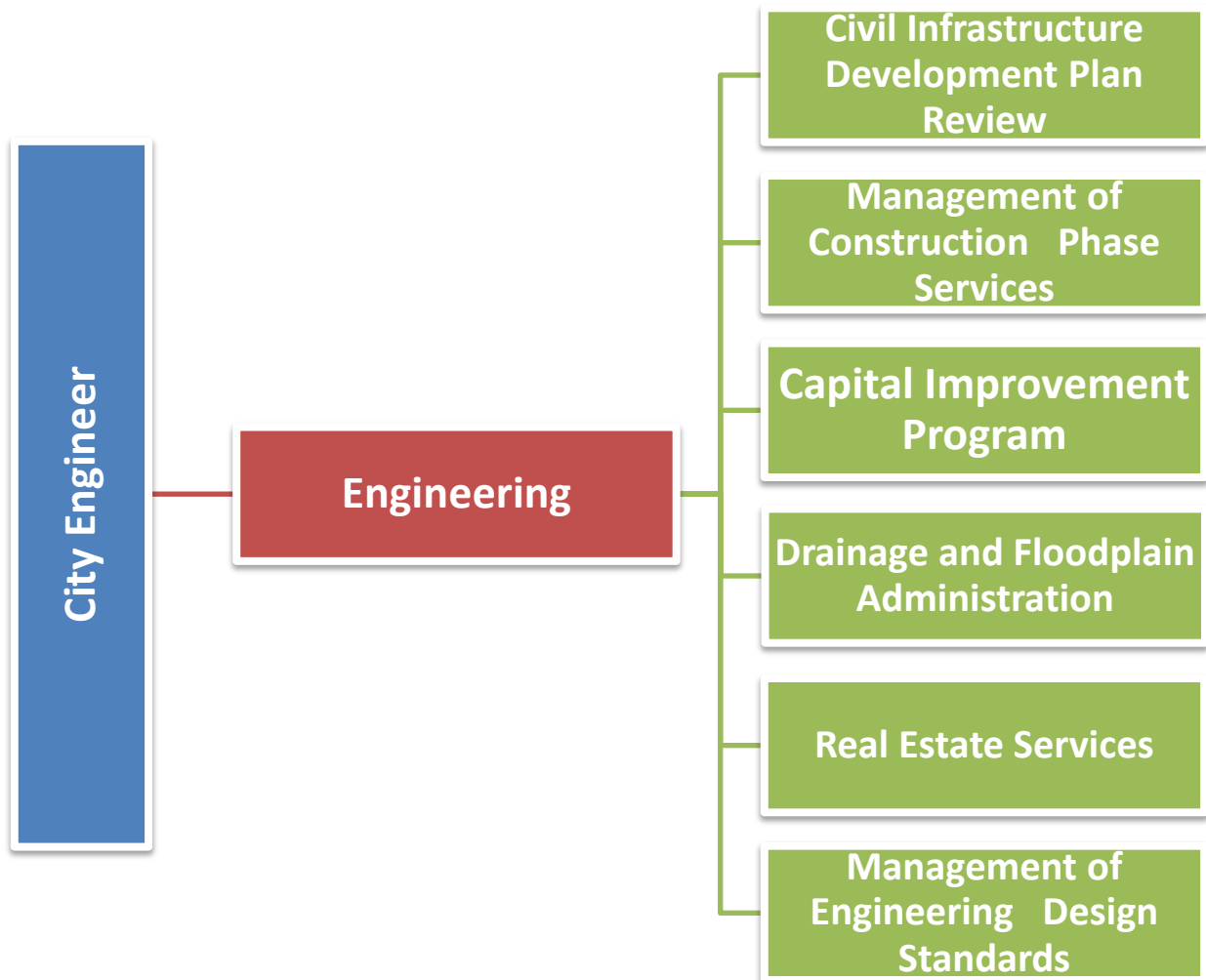
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ENGINEERING DEPARTMENT

2013 BUSINESS PLAN

FUNCTIONAL STRUCTURE



2013 PROGRAM OF SERVICES

ENGINEERING

SERVICES AND SERVICE LEVELS

Service: Civil Infrastructure Development Plan Review

Civil Infrastructure Development Plan Review includes the following:

Development Zoning, Plat and Plan Review - Provides oversight and review of development submittals for compliance with the City's Design Standards and Development Code. Submittals include general plans, zoning requests, plats, site plans, drainage plans, construction plans, variance and specific approval requests, and traffic impact analyses. Facilitates a process for providing comments to development applicants and ensuring comments are addressed. Works with other departments, including Public Works, Utilities, Parks, and Fire to incorporate their comments as needed and ensure their comments are consistent with established design standards, development code requirements, and format and quality levels.

Development Review Committee – The Sr. Engineers lead this committee with the City Planner which conducts weekly meetings with potential development applicants to review proposals and City regulations that may impact or be applied to the proposed development activity. Regular attendance at these meetings insures that all of the regulations are being covered and that the applicants are aware of all regulations that need to be accounted for prior to formalizing the submittal to the City. Plans are also reviewed with applicants that may be receiving comments back on previous submittals. This process helps to reduce the number of submittals for developer compliance as well as assisting the applicants in fully understanding the comments and what needs to be addressed.

Development Agreements and Master Plans – Supports the development review process with related activities, including facilitating development agreements, ensuring compliance with City agreements or other requirements, regional infrastructure planning and coordination with developers, coordination with construction phase issues, and working with the Planning and Zoning Commission and City Council. Facilitates the agreements and the relationship of the agreements with outside and third party agencies and provides assurance that all required items and components are included. Also, verify the compliance of all proposed developments with Master Plans.

Planning and Zoning Meetings – Engineering provides staff recommendations to the Planning and Zoning Commission for all cases being heard that have an engineering issue or are regulated by sections of the Development Code or Design Standards through engineering. Information is provided to the Planning Department for reporting purposes and Engineering staff attend the meetings in order to address any concerns that may arise from the Commission members. P&Z meets twice a month and the Engineering Department is represented at each meeting.

Asset Management – Supports the Accounting Department with tracking and accounting of new capital assets constructed as part of development projects. Engineering provides a value and life expectancy with all background documentation to accounting for asset management purposes for all infrastructure related items constructed as part of new development.

Service: Management of Construction Phase Services

The Engineering Department is responsible for all construction oversight in the City for public infrastructure. The Construction Services Manager (CSM) is responsible for ensuring that all infrastructure is constructed in accordance with plans and specifications, that materials meet the approved products list, that the design standards are being adhered to and that materials used are only those of approved quality. The CSM reports to the City Engineer and works with the Assistant City Engineer to ensure proper coordination between construction activities and the plan review process is occurring. The CSM is assisted by five construction Inspectors and one Senior Construction Inspector to monitor all field activities. Departmental goals include oversight of every major construction activity (subgrade preparation, paving, utility installation, etc.) and visual inspection of all other related minor construction activities (density test, bacteria test, ditch backfill and compaction, etc.).

Pre-construction Meeting – The CSM or representative project inspector, with the PM or project engineer, conduct the preconstruction meeting with the contractor for both development and capital improvements. These are held for every project that involves civil infrastructure and are used to provide a consistent communication loop between the contractor and the City and establish chain of command and the relationship early on. This provides a time for introductions and process explanation for pay applications, materials testing scheduling and any other issue that may need to be discussed.

Project Acceptance – This is what formalizes the project's acceptance by the City and identifies that all major steps have been completed and that all documentation is present and has been submitted for review and conformance with guidelines. This process consists of four (4) phases:

1. Substantial Completion – Acceptance that all pay items of work are complete and the improvements are available for use.
2. Creation of a “punch list” that provides details for the contractor of all deficiencies remaining to reach initial acceptance.
3. Initial Acceptance – acknowledges that all punch list items are complete and that the one-year warranty period can formally commence.
4. Final Acceptance – is achieved with the successful resolution of all deficient work items twelve (12) months from the date of initial acceptance.

Although there are differences in development and capital projects, the department manages the processes in very similar manners. This approach provides consistency which allows easier tracking of every project and similarity with each project acceptance improves efficiencies in managing the process.

Construction Inspection - Oversee the construction process for capital Improvement and new development of public infrastructure. Coordinate preconstruction, progress or other meetings with contractors, developers, developer's field representatives and engineers. Provide on-site inspection services overseeing construction of all public infrastructure, including streets, drainage, utilities, parks and traffic. Resolve issues and address concerns with development inspectors, engineers and other City departments, including Public Works, Parks, Facilities, Airport and Utilities. Coordinate with project engineers to ensure compliance with agreements and codes as established through the development review process. The importance of the service provided by the inspection group is realized in the long term reliability of the infrastructure that is constructed. Proper installation, oversight and adherence to our standards ensures longevity from the system which reduces short and long term maintenance costs as well as verifying adherence to contract specifications, design standards and development agreements. Depending on scope and complexity, project inspectors may be assigned multiple projects simultaneously, providing daily spot inspection and full-time inspection during critical phases of the project. The Project Inspectors are also responsible for enforcing Traffic Control Plans, Trench Safety Plans and Storm Water Pollution Prevention Plans as they relate to construction activity.

Project Documentation - A Daily Inspection Report for each project is prepared by the project inspector containing information regarding conversations with stakeholders and contractors, working conditions, weather, work progress, deficiencies or defects discovered and changes in work. These are maintained in an electronic database developed in conjunction with the IT department. Change Orders are used for changes in work not anticipated that can be approved in the normal course of business. These documents become part of the organizational assets and can be used to protect the City in litigation if necessary. These documents are used to connect the design of the project to the final constructed result and they document that process. Proper documentation of this process assists problem solving should any issue arise.

Coordination of Subcontracts - Project Subcontracts are for project support services. These services include materials testing, surveying and construction phase services assistance and will provide the City with detailed reports of all tests performed or submittals reviewed and approved. Such reports will specifically identify and provide extensive details regarding any deficiencies in the work as performed by the project contractor. All project related documents will be retained in the project files to enable engineering staff to address premature failures, work methodology issues, possible litigation and budget reference.

Pay Request Processing - Engineering is responsible for pay request processing for all CIP related invoices. On a Monthly basis, the Engineering Department processes pay requests for all ongoing projects. The department's rapid turn-around for pay request benefits the City with improved pricing for work performed by improving contractor cash flows and that relationship.

Prior to approval of a project pay request, the project inspector and project manager will audit all job related payment estimates against the actual measured quantity of work performed.

The Program Coordinator, with assistance from the Project Manager, will perform a line item audit for the pay request, taking into account all previously approved pay requests, field changes, retainage and approved change orders. After a pay request has been approved, the Program Coordinator receipts and logs the approved pay request.

Project Reconciliation - Prior to initial acceptance of a project, the Program Coordinator, with assistance of the Project Manager and Inspector, will audit all job related payments against the actual measured quantity of work performed. This audit will take into account all previously approved field changes and change orders and may result in a final or reconciling change order that will be routed through normal channels for processing.

Fixed Asset Updates - The Construction Services Division supports the Project Manager/Engineer in providing the Accounting Department with a fixed asset inventory categorized by type and subtype of asset with associated asset values for all completed projects. There is a life expectancy established with each asset constructed or improved and these are tracked as part of that system.

Service: Capital Improvement Program

The Engineering Department is responsible for managing all phases of the Capital Improvement Program. The CIP is the single largest funding demand of the City and typically makes up well over 50% of the City's annual budget. Maintaining sound management and financial responsibility of the CIP is of the utmost importance to the department. There are a number of areas related to the CIP and they are identified below.

CIP Development - The Engineering Department manages and oversees the development of the 5 - year Capital Improvement Program and works closely with the Budget Department in preparing this document. The development starts with the creation of the calendar which identifies a time allotment for each step of the process and requires certain products be developed at each step. The product begins as a preliminary list of proposed projects and culminates as a complete list of verified, scheduled and fully deliverable and funded CIP projects that comprise the 5 - year CIP program. The department, through this annual process, works with Owner departments and Stakeholders to assure accuracy and completeness of requests for capital projects. The department reviews requests and verifies that a clear and accurate scope, schedule and budget have been established, as well as a complete description and justification for each project requested. The department manages the ranking and prioritization of the projects and establishes schedules based on funding and staffing availability. The department delivers a list of projects, schedules and estimates to the Budget Office for funding sources to be identified and financial modeling to be established. The department recommends the projects to the Executive Team for their consideration and input and presents the 5 - year CIP with emphasis on year one to the City Council and the P&Z Commission as required by City Charter.

Professional Services Selection - The Engineering Department is responsible for managing the selection of consultants for professional services contracts for CIP Projects. Adherence to state and city policies is critical to consistency and transparency. A critical part of this program includes conducting bi-monthly presentations for consultants interested in doing business with the City. This process is managed by the

Executive Secretary to the City Engineer and multiple staff members attend in order to learn more about the consultants. The department maintains a library of qualification statements for consultants that have either done work for the City or are on the list of acceptable consultants that can be used. SOQ's are kept on file for companies that provide services along the lines of: architectural, geotechnical testing, surveying, engineering, property appraisals, landscape architecture, etc. These SOQ's are maintained for a two year period and then are revised and updated through requests from the consultants at that time. This is done to maintain a level of comfort with current staffing levels by our professional service providers and City staff.

Professional Services Contracts – The department is responsible for developing the clear scopes for each project with the owners and stakeholders. Measures used to clarify the scopes include the use of project charters for each project that are developed by the project team led by the Engineering project manager. These scopes are used to generate level of efforts by the consultants that are used to develop fees for the services to be provided. The Project Engineers and Managers are responsible for developing the project parameters with the owner and stakeholder groups and managing the development of the scope, schedule and budgets for each project that will be managed. Negotiation of these contracts is the first step in establishing a strong relationship with the professionals conducting this work for the City.

The project manager must control the scope, schedule and budget for the design phase and assure that the final design can be constructed within the approved budget. Currently all of the Preliminary Engineering Report (PER) and design contracts within the CIP are outsourced to professional consultants within the particular fields required for each project. The Engineering Department manages the contracts and oversees each project in the role of Project Manager (PM).

An added part to the charter process this year was the development and inclusion of responsibility / accountability charting for each project. This process better determines task managers for steps required in each project and provides the direction for communicating certain steps of the project with the internal and external participants. Building on this we also created a communication matrix that is used for three different project levels that have been defined as: Local, Sub-regional and Regional level projects. This tool assists the project managers and engineers in defining and how to utilize the resources available and to think through the project and when and what to communicate.

Project Delivery Methods – The City Engineer and staff provide the expertise in identifying the different approaches to project delivery. This is done by staying abreast with legislative changes and providing the expertise to deliver technically difficult projects or projects with expedited schedules. The Engineering Department provides the insight and technical knowledge to provide these services and deliver projects utilizing all acceptable delivery methods.

The department maintains an educational level on alternative delivery and their applications to assist and direct the City for various project types with varying technical difficulties. Understanding the details of each method of delivery and the varying differences between each is necessary to identifying the best

approach and to understand the necessary level of staff effort and time that each will take to complete the project.

Construction Oversight – The department, through each Project Manager/Engineer, provides construction oversight for each project managed by the department. This role supports the Construction Inspector and is responsible for managing issues related to the design side of projects and maintaining relationships developed through the design process. Maintaining schedule and budgetary compliance are roles conducted by the PM for the projects they manage.

CIP Quarterly Update – The department is responsible for providing the quarterly update to the City Manager and City Council for all active projects ongoing in the CIP. This update consists of a working spreadsheet that tracks progress on all aspects of the project phases and a cover memo that addresses the overall progress of the program as a whole indicating percent of projects on schedule and major project updates as requested by City Council. It reports on latest project update, schedule progress, project manager and project phase.

Asset Management – Supports the Accounting Department with tracking and accounting of new capital assets constructed as part of development projects. Engineering provides a value and life expectancy with all background documentation to Accounting for asset management purposes for all infrastructure related items.

Service: Drainage and Floodplain Administration

The Drainage and Floodplain Administration service includes three components: Floodplain Administration, Maintenance, coordination and monitoring of river and major drainage structures during heavy rainfall events, and Integrated Storm Water Management modeling (ISWMM). These are outlined below.

Floodplain Administration – Administer the regulations as adopted in the City's Flood Damage Prevention Regulations of the Development Code and as a participant in the National Flood Insurance Program (NFIP). The Engineering Department will enforce the adopted Flood Damage Prevention regulations through the issuance of development permits for floodplain related activities and the associated FEMA requirements. This is done as part of the development review process working in close conjunction with the planning department and the building official in permitting and regulating development in Special Flood Hazard Areas (SFHA). All services are provided in-house by the City Engineer and assigned Certified Floodplain Managers.

The department will update and maintain the most current (Effective) Flood Insurance Rate Maps (FIRMs) and subsequent map revisions. Staff will provide current (best available) floodplain related data to the development community, engineer, and other stakeholders as well as work with FEMA and other agencies in updating and adopting new FIRMs.

Performing these functions allowed the City to receive entry into the Community Rating System (CRS). This has allowed flood insurance customers to receive a lower premium when impacted by a special

flood hazard area. The City's initial rating into the system was a 7 and these duties will need to be performed and maintained to uphold, if not improve, the City's ranking in the CRS.

Flood Event Monitoring – Provide constant monitoring of the Brazos River and our major ditch systems and drainage networks during major rainfall or riverine situations. The Brazos River and Oyster Creek cover both large and small drainage sheds that stretch beyond the City's limits and have distinctively different impacts to our residents. Impacts within the watersheds of each can have a negative impact on the City in varying ways and these are monitored through tools that have been developed over the years and within the integrated storm water management model (ISWMM) and other drainage tools, such as the Master Drainage Plan and the flood insurance rate maps. Maintenance of the tools through the ISWMM and other drainage modeling assist in being able to predict and forecast these major drainage systems. Data provided from these models is made available to the City's Emergency Operations Center (EOC) and Public Works staff to coordinate operations in the event of an emergency/impending flood situation as well as ongoing maintenance needs identified through the use of the ISWMM model. This data would also be made available to engineers/consultants and other entities to aid in evaluating the performance of the City's drainage system and in the design of drainage infrastructure projects.

ISWMM – The management of all drainage models and structure inventory city-wide through the GIS system. Engineering conducts the background data and research using third party consultants that take and calibrate existing drainage models into newer and more accurate 2D drainage modeling. This analysis assists the department in finding deficient areas within the City that may need improvements.

ISWMM is also used to run iterations for different coincidental rainfall events to develop a better understanding of the operational side and efficiency of the City's drainage system. It will provide hot spots through coincidental rainfall analysis to better determine problem locations and alternative routes for traffic and emergency responders. It also provides clear guidance on the instance of a levee breach situation due to a high river situation as well as major rainfall event within the levee system and coincidental situations and how the City would have to respond and how communications between entities impacts these situations.

Service: Real Estate Services

Real Estate Services manages all land, easement and right-of-way acquisition needs related to the CIP as well as assisting with other simple acquisitions as needed. This service utilizes outside consultants to assist in property background research (title, deeds, appraisals and survey) and property ownership verification. This service also handles all abandonments of easements and rights-of-way as identified through development and other activities.

Coordination of this service with the CIP process and projects is critical to the maintenance of schedules. Land acquisition can be a large budgetary constraint to projects and if not handled appropriately, can lead to serious delays to the schedule that cannot be overcome. The service is critical to be identified early when related to CIP projects.

Service: Management of Engineering Design Standards

The constant maintenance of design standards and approved products lists are critical to the City maintaining consistency and improvements in creating a better infrastructure system. These are used day-to-day and week-to-week for planning, designing and constructing public improvements. The Engineering Department maintains and keeps current these important documents that are referenced and utilized by many of our outside development groups and design consultants. Having the latest and best available information and technical standards maintains Sugar Land's status as a leader in the Houston area as well as nationally.

The City's Design Standards are a critical element to ensuring that all planned civil infrastructure improvements are constructed within acceptable practices. They provide the development and consultant community with the established standard requirements adopted by the City and the Engineering Department for infrastructure requirements and design elements. The Design Standards identify general guidelines and standards for infrastructure improvements and design elements for all engineering related principles including roads, drainage, traffic, water, wastewater and other related civil infrastructure within the City. The Engineering Department maintains the standards and has continual collaboration with internal departments about these standards and necessary updates. Since the adoption of the 2007 version by City Council, the Engineering Department has conducted at least 2 major additions and a number of smaller corrections to the design standards every year. This is done in coordination with the engineering and construction community and our internal departments to solidify our standards and keep them up to date with the ever changing environment.

The second part of this objective is to manage the City's approved products list. This list provides to all development and CIP projects the approved products that have been identified for use in the infrastructure system. The Engineering Department works closely with Public Works, Utilities and various other internal departments as needed, along with our outside vendors, to keep this up-to-date.

SERVICE LEVEL EXPECTATIONS

| Program: Engineering | |
|---|---|
| Service | Service Level Expectation |
| Civil Infrastructure Development Plan Review | Public infrastructure plans meet established design standards, code requirements, City Council goals and quality levels. <ul style="list-style-type: none"> • 90% of plans are reviewed within established 3 weeks • 90% of Traffic Impact Analysis are reviewed within 4 weeks |
| Management of Construction Phase Services | Public infrastructure is built in accordance to specifications and design standards using methods acceptable to our standards and materials of approved quality. <ul style="list-style-type: none"> • 100% of infrastructure is constructed to City standards • Inspections are performed daily and tracked through the online daily inspection reports |
| Capital Improvement Program | The Five Year Capital Improvement Program is aligned with City Council direction, charter requirements and addresses identified community needs and are focused to address the City's goals. <ul style="list-style-type: none"> • 90% of projects on budget • 70% of projects on schedule |
| Drainage and Floodplain Administration | Flood damage regulations are upheld and fulfilled using effective flood system monitoring and accurate drainage modeling as well as permitting process for improvements. <ul style="list-style-type: none"> • 100% compliance with Flood Damage and Prevention Ord. • Maintenance of FEMA Flood Insurance Rate Maps are up to date |
| Real Estate Services | Property acquisitions are efficient, effective, and support the City's capital improvement efforts as well as development needs through abandonment or encroachment. |
| Management of Engineering Design Standards | Design standards meet acceptable requirements for quality and function. Impact of current and proposed workload through Development, CIP and Strategic Projects will not allow the department to address the improvements to the design and development standards as has been done in the past. |